National Aeronautics and Space Administration

NASA's Impact in Massachusetts: A Tech Transfer Perspective

You know that NASA studies our planet, our sun, the solar system, and the Universe.
But did you know about the space program's economic impact here on Earth?

In 2011, NASA invested nearly **$177 million** in the state of Massachusetts.

Since 2001, NASA's SBIR/STTR Program has invested nearly **$139 million** in **113 Massachusetts companies** and more than **$1.2 billion** nationwide.

How NASA's SBIR/STTR Program Benefits Massachusetts

NASA is committed to moving technologies and innovations into the mainstream of the U.S. economy, and the Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) program helps fulfill this goal.

SBIR/STTR stimulates technological innovation by encouraging small, high-tech companies—particularly minority and disadvantaged businesses—to partner with NASA to help meet its research and development needs in key technology areas. At the same time, this program strengthens small companies by enabling them to bring cutting-edge new products into the U.S. economy.

The list to the right highlights Massachusetts businesses that received SBIR/STTR contracts from NASA since 2006. **(Visit http://sbir.nasa.gov for more information on the SBIR/STTR program.)**

www.nasa.gov

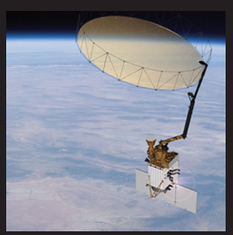
NASA SBIR/STTR Companies in Massachusetts

Advanced Mechanical Technology, Inc.	Watertown
Aerospace & Bonded Structures	Billerica
Applied NanoFemto Technologies, LLC	Lowell
Arradiance, Inc.	Sudbury
Autonomous Exploration, Inc.	Andover
Beam Power Technology, Inc.	Sudbury
Broadband Photonics, Inc.	Woburn
CADNexus, Inc.	Burlington
Cambrian Innovation, LLC	Boston
digitROBOTICS, LLC	South Deerfield
Dynamic Sensing Technologies	Amherst
Eikos, Inc.	Franklin
Electrolytic Research Corporation, LLC	Sudbury
EM4, Inc.	Bedford
EOS Photonics	Cambridge
Espace, Inc.	Hull
Hardric Laboratories, Inc.	North Chelmsford
Innovative Communications Engineering	North Chelmsford
Interactive Supercomputing, Inc.	Waltham
Jenike & Johanson, Inc.	Tyngsboro
Kaitech, Inc.	Marshfield
Kernco, Inc.	Danvers
Kopin Corporation, Inc.	Westboro
LongWave Photonics, LLC	Boston
Luminad Technologies	Sharon
Magnolia Solar, Inc.	Woburn
Maxion Technologies, Inc.	Andover
Microscale, Inc.	Woburn
Nanotrons	Woburn
Nanowave, Inc.	Sutton
OptiCOMP Networks	Attleboro
ORB Analytics, LLC	Concord
Pulse Systems, Inc.	Canton
QM Power, Inc.	Boston
Radiant Acoustics, Inc.	Wellesley
ReMetAl, LLC	Holliston
SeaFire Micros, Inc.	Beverly
SeaLite Engineering	Cataumet
TelAztec, LLC	Burlington
TIAX, LLC	Lexington
XCube Communication, Inc.	Westford

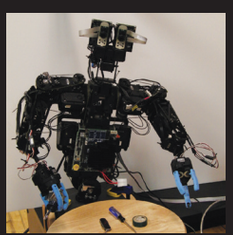
massachusetts

How NASA Spinoffs Benefit Massachusetts

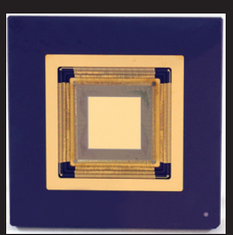
Aerogel Is Extreme Insulation for Extreme Environments *(Northborough)*
Aspen Aerogels, Inc. is one of the leading U.S. providers of aerogel, producing nearly 20 million square feet of the material per year. Developed with NASA funding, aerogels have the lowest thermal conductivity of any known solid and are flexible, durable, and easy to use. NASA employs the company's products for numerous cryogenic applications, and industrial uses range from insulating pipes to manufacturing building materials. This NASA-derived innovation is now available in boots, jackets, and sleeping bags.



Radiometers Track Environmental Changes, Enhance Climate Knowledge *(Amherst)*
NASA funding helped ProSensing, Inc. develop low-cost, compact radiometers for mapping fluctuations in soil moisture, ocean salinity, and wind speeds. Small, lightweight, and affordable, the multi-channel radiometers use wavelengths to measure natural radiation, which fluctuates with changes in moisture and salinity. NASA, multiple universities, and international research centers use this data to study Earth's responses to natural and human-induced changes. The technology is also being used to measure ocean wind speeds in hurricanes.



Toolkit Readies Robots for Work in Diverse Environments *(Cambridge)*
NASA is looking to complex robotics to reduce the risk and cost of space operations. With NASA funding, Energid Technologies Corporation developed robot control and simulation software for a host of applications. The toolkit automatically converts user-identified constraints into real-time algorithms to control robot joint motions. Control capabilities are possible for multiple robot and joint types having numerous degrees of freedom and bifurcations. Applications include health care, industrial automation, space, agriculture, underwater environments, and military operations.



High-Tech Mirrors Correct Optical Distortions from Telescopes to Microscopes *(Cambridge)*
NASA funding accelerated by years the development of technology that observatories worldwide use for astronomical imaging. Boston Micromachines Corporation produces microelectromechanical system deformable mirrors (DMs), which adjust their shape or position to correct for aberrations (optical phenomena that lead to blurring or distortion). In addition to their use in space-based telescopes, the compact, low-power, and lightweight DMs also are used in laser communication systems and in microscopy.

NASA Know-How Helps Harness Wind Power *(Westport Point)*
Wind turbines produced by Aerostar, Inc. provide electricity to homes, farms, and remote locations with limited or no connection to the power grid. The turbines feature teetering, two-bladed rotors (much like early NASA designs) that decrease weight and cost by reducing gyroscopic loads imposed on the turbine and its tower. Aerostar benefitted greatly from National Wind Technology Center design software that incorporates NASA performance parameters for two-bladed, fixed pitch turbines.

Mobile Instruments Measure Air Pollutants Onboard Vans, Aircraft, and Ships *(Billerica)*
Aerodyne Research, Inc. produces spectrometers that measure distribution of ground-based air pollutants in real time. Used in mobile laboratories aboard vans, aircraft, and ships, these compact and automated instruments detect more than 15 greenhouse gasses and pollutants and can determine, for example, which neighborhoods are most affected by emissions from local airports. Developed with NASA funding, the spectrometers are in use at academic, government, and industrial air quality and climate change laboratories on five continents.

NASA actively seeks partnerships with U.S. companies that can license NASA innovations and create "spinoffs" in areas such as health and medicine, consumer goods, transportation, renewable energy, and manufacturing. When businesses leverage NASA technologies to develop new products, it not only benefits the regional economy, but significantly strengthens the nation's competitiveness in the global marketplace.

NASA's centers across the country have helped 167 Massachusetts companies develop revolutionary spinoff technologies.

Learn more about how NASA innovations benefit the public in *Spinoff*, an annual publication that highlights NASA's most significant technology transfer successes.
(Available at: http://www.sti.nasa.gov/tto)

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